

**WE CLAIM:**

1. A method comprising:

modifying data of a data volume to create modified data;

a primary node transmitting the modified data to a first secondary node, wherein the first secondary node comprises a first replica of the data volume;

the first secondary node receiving and processing the modified data to generate processed data;

the first secondary node transmitting the processed data to the primary node;

the primary node receiving and transmitting the processed data to a second secondary node, wherein the second secondary node comprises a second replica of the data volume.

2. The method of claim 1 further comprising the first secondary node overwriting data of the first replica with the modified data.

3. The method of claim 1 wherein the first secondary node processes the modified data according to a data compression algorithm.

4. The method of claim 3 further comprising:

the first secondary node reading data from the first replica in response to receiving the modified data from the primary node;

the first secondary node processing the modified data and the data read from the first replica according to the data compression algorithm to generate the processed data.

5. The method of claim 1 wherein the first secondary node processes the modified data according to a checksum algorithm.

6. The method of claim 5 further comprising:  
the first secondary node reading data from the first replica in response to receiving the modified data from the primary node;

the first secondary node processing the modified data and the data read from the first replica according to the checksum algorithm to generate the processed data.

7. The method of claim 1 wherein the first secondary node processes the modified data according to a data encryption algorithm.

8. The method of claim 1 wherein the first secondary node processes the modified data according to a difference computation algorithm.

9. The method of claim 8 further comprising:

the first secondary node reading data from the first replica in response to receiving the modified data from the primary node;

the first secondary node processing the modified data and the data read from the first replica according to the difference computation algorithm to generate the processed data.

10. The method of claim 1 wherein the primary node transmits the modified data to the first secondary node via a first communication link, wherein the primary node transmits the processed data to the second secondary node via a second communication link, wherein the first communication link is defined by a first data transmission bandwidth, wherein the second communication link is defined by a second data transmission bandwidth, and wherein the first data transmission bandwidth is greater than the second data transmission bandwidth.

11. The method of claim 10 wherein the first replica is maintained as a synchronous replica of the data volume, and wherein the second replica is maintained as an asynchronous replica of the data volume.

12. The method of claim 1 further comprising the first secondary node transmitting the processed data to a third secondary node, wherein the third secondary node comprises a third replica of the data volume.

13. A computer readable medium storing instructions executable by a computer system, wherein the computer system is contained in a first secondary node in data communication with a primary node, wherein the primary node comprises a data volume, wherein the first secondary node comprises a first replica of the data volume, wherein the computer system implements a method in response to executing the instructions and in response to receiving modified data of the data volume from the primary node, the method comprising:

overwriting data of the first replica with the modified data;  
processing the modified data to generate processed data;  
the first secondary node transmitting the processed data to the primary node.

14. The computer readable medium of claim 13 wherein the modified data is processed according to a data compression algorithm.

15. The computer readable medium of claim 14 wherein the method further comprises:

reading data from the first replica;  
processing the modified data and the data read from the first replica according to the data compression algorithm to generate the processed data.

16. The computer readable medium of claim 13 wherein the modified data is processed according to a checksum algorithm.

17. The computer readable medium of claim 16 wherein the method further comprises:

reading data from the first replica;  
processing the modified data and the data read from the first replica according to the checksum algorithm to generate the processed data.

18. The computer readable medium of claim 13 wherein the modified data is processed according to a data encryption algorithm.

19. The computer readable medium of claim 13 wherein the modified data is processed according to a difference computation algorithm.

20. The computer readable medium of claim 19 wherein the method further comprises:

reading data from the first replica;  
processing the modified data and the data read from the first replica according to the difference computation to generate the processed data.

21. The computer readable medium of claim 13 wherein the first replica is maintained as a synchronous replica of the data volume.

22. The computer readable medium of claim 13 wherein the method further comprises transmitting the processed data to another secondary node, wherein the other secondary node comprises another replica of the data volume.

23. A data system comprising:

a primary node in data communication with first and second secondary nodes via first and second communication links, respectively;  
the primary node comprising a data volume;  
the first and second secondary nodes comprising first and second replicas, respectively, of the data volume;  
a primary node comprising means for transmitting modified data of the data volume to the first secondary node;  
the first secondary node comprising means for receiving and processing the modified data to generate processed data;  
the first secondary node comprising means for transmitting the processed data to the primary node;  
the primary node comprising means for receiving and transmitting the processed data to the second secondary node.

24. A method comprising:  
processing data at a secondary node, wherein the secondary node comprises a replica  
of a first data;  
transmitting the results of the data processing to a primary node, wherein the primary  
node comprises the first data.

25. The method of claim 24 wherein the first data comprises a data volume.

26. The method of claim 24 wherein the first data comprises a file system.

27. The method of claim 24 wherein the first data comprises a database.

28. The method of claim 25 wherein processing data includes counting the  
number of transactions generated to write data to a hard disk allocated to store data of the  
data volume replica in a given period of time.

29. The method of claim 25 wherein processing data includes identifying the  
number of times an access time stamp changes in a given period of time.

30. The method of claim 25 wherein processing data includes defragmenting a  
replicated file, and wherein the results comprise an allocation of one or logical memory  
blocks of the data volume replica to the replicated file.

31. A computer readable medium executable by a computer system of a secondary  
node, wherein the computer system implements a method in response to executing the  
instructions, the method comprising:

processing data, wherein the secondary node comprises a replica of a first data;  
transmitting the results of the data processing to a primary node, wherein the primary  
node comprises the first data.